TERRACE LAKES RESORT (PWS 4080047)
SOURCE WATER ASSESSMENT FINAL REPORT

January 3, 2003

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Terrace Lakes Resort, Garden Valley, Idaho,* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Terrace Lakes Resort public water system (PWS #4080047) consists of two wells: Well #1-Main and Well #2-Lodge. The maximum daily demand on the wells was 30 gallons per minute (gpm) in March 1996. Growth was expected to cause the demand to increase in 49 gpm (Scanlan, 1996). The system serves approximately 330 people through 250 connections (DEQ, 2002).

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic chemical (IOC, i.e. nitrates, arsenic) contaminants, volatile organic chemical (VOC, i.e. petroleum products) contaminants, synthetic organic chemical (SOC, i.e. pesticides) contaminants, and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, the Well #1-Main and Well #2-Lodge automatically rate high for IOCs because of multiple fluoride detections exceeding the maximum contaminant level (MCL) of 4.0 parts per million (ppm). In addition, Well #2-Lodge automatically rates high for VOCs and SOCs because access is not restricted to vehicular traffic within 50 feet of the wellhead. Except for these cases, the wells rated moderate for other contaminants. System construction scores and hydrologic sensitivity scores rated moderate for Well #1-Main and high for Well #2-Lodge. Potential contaminant inventory/land use scores were low due to a lack of contaminant sources, except for Well #2-Lodge, which rated moderate land use for VOCs.

The primary contaminant of concern is the IOC fluoride. Well #1-Main has had fluoride levels of 5.0 ppm (October 1993), 9.62 ppm (December 1998), 9.4 ppm (December 1999), and 4.35 ppm (November 2000). Well #2-Lodge has had fluoride levels of 4.74 ppm (March 1994). Traces of the IOCs arsenic, cadmium, and nitrate have been detected in the wells. Arsenic was measured at 6 parts per billion (ppb) in the Well #1-Main. In October 2001, the EPA lowered the MCL for arsenic from 50 ppb to 10 ppb, giving systems until 2006 to come into compliance. No SOCs or VOCs have ever been detected in the tested well water. No bacterial contaminants have ever been detected at the wells.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Terrace Lakes Resort, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Actions should be taken to keep a 50-foot radius circle around the wellhead clear of potential contaminants. Restricting access to vehicles and other unauthorized access within this 50-foot radius circle would reduce the susceptibility scores of Well #2-Lodge from high to moderate. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of Terrace Lakes Resort, collaboration and partnerships with state and local agencies and industry groups should be established and are critical to success. Because the fluoride in the well has exceeded the level of the revised MCL, the Terrace Lakes Resort water users may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system.

According to a press release posted on the EPA website (www.epa.gov), the EPA intends to provide up to $20 million over the next two years for research and development of more cost-effective technologies to help small systems meet the new standard and provide technical assistance to small system operators. The EPA has also stated that it "will work with small communities to maximize grants and loans under current State Revolving Fund and Rural Utilities Service programs of the Department of Agriculture." (USEPA, 2001, para 5). EPA (2002) recently released issue papers entitled *Proven Alternatives for Aboveground Treatment of Arsenic in Groundwater (EPA-542-S-02-002)* and *Arsenic Treatment Technologies for Soil, Waste, and Water (EPA 542-R-02-004).* These issue papers discuss various treatment options for arsenic and give examples of where each of these technologies have been applied. Information can be accessed at the following EPA website http://www.epa.gov/safewater/arsenic.html.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. The primary source of potential contaminants comes from the local transportation roads within the delineation. Therefore the Department of Transportation or other federal agencies should be involved in protection activities.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR
TERRACE LAKES RESORT, CROUCH, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Terrace Lakes Resort public water system (PWS #4080047) consists of two wells: Well #1-Main and Well #2-Lodge. The maximum daily demand on the wells was 30 gallons per minute (gpm) in March 1996. Growth was expected to cause the demand to increase in 49 gpm (Scanlan, 1996). The system serves approximately 330 people through 250 connections (DEQ, 2002). The wells are located in Garden Valley, west of the Middle Fork Payette River and north of Crouch (Figure 1).

The primary contaminant of concern is the IOC fluoride. Well #1-Main has had fluoride levels of 5.0 ppm (October 1993), 9.62 ppm (December 1998), 9.4 ppm (December 1999), and 4.35 ppm (November 2000). Well #2-Lodge has had fluoride levels of 4.74 ppm (March 1994). Traces of the IOCs arsenic, cadmium, and nitrate have been detected in the wells. Arsenic was measured at 6 ppb in the Well #1-Main. In October 2001, the EPA lowered the maximum contaminant level (MCL) for arsenic from 50 ppb to 10 ppb, giving systems until 2006 to come into compliance. No SOCs or VOCs have ever been detected in the tested well water. No bacterial contaminants have ever been detected in the tested well water.

Defining the Zones of Contribution – Delineation

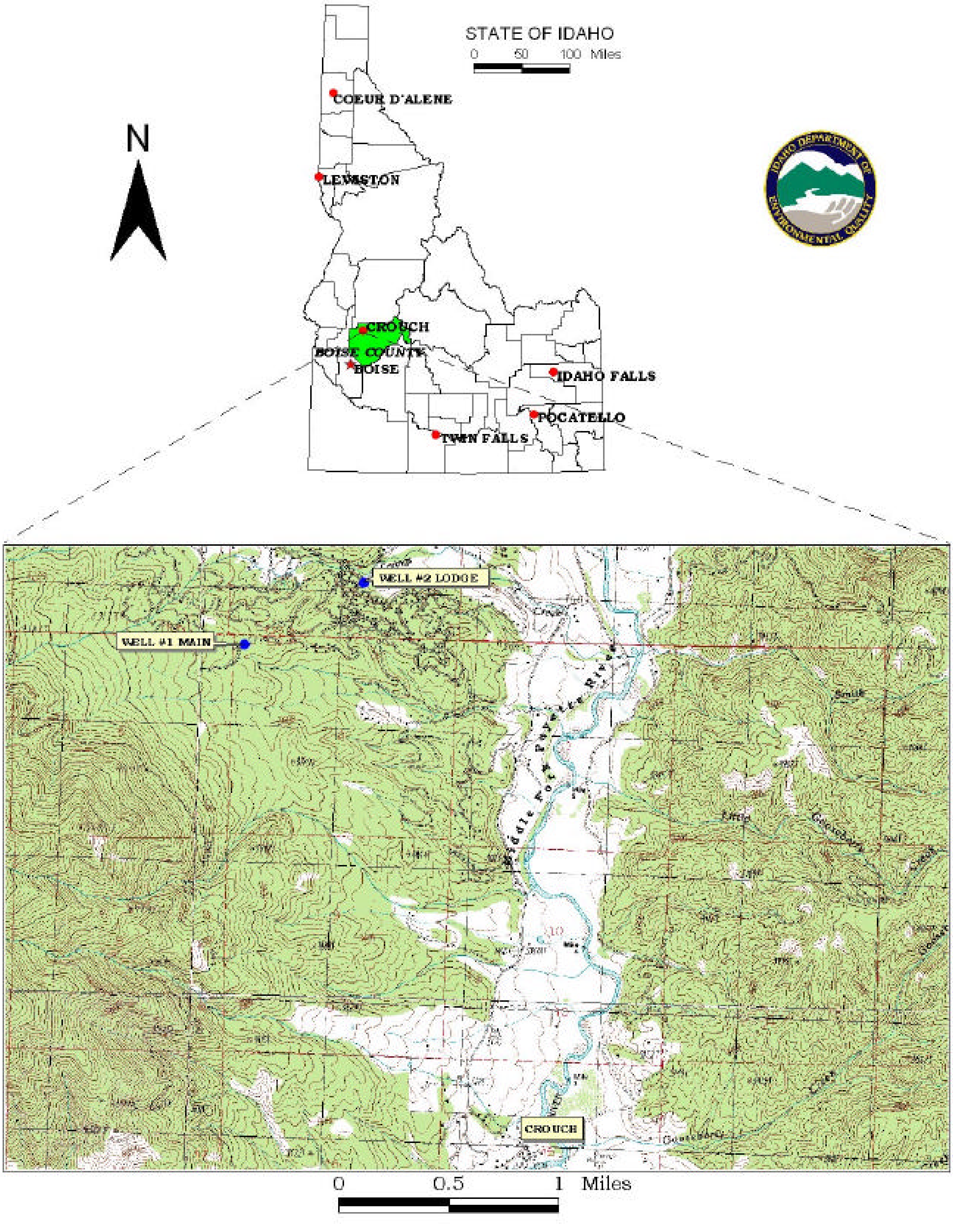
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ performed the delineation using a refined analytical element computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Garden Valley aquifer in the vicinity of the Terrace Lakes Resort. The computer model used site specific data, assimilated by DEQ from a variety of sources including Terrace Lakes Resort well logs, other local area well logs, and hydrogeologic reports (detailed below).

General Geology for the Garden Valley aquifer system

The Garden Valley province lies in the western portion of the Idaho Batholith, a large granitic mass that underlies much of central Idaho. Northeast-trending faults occur in the granite throughout the area. The western side of the valley is cut by a large north-south trending fault that appears to be an extension of the Boise Ridge Fault (Scanlon, 1996). Garden Valley is considered a structural basin produced by Tertiary faulting (Weis, 1994). Geologic materials underlying surficial soils consist of alluvial sandy gravel with cobbles deposited by the Middle Fork of the Payette River (Fisher et al., 1992). The Payette Formation, composed of poorly consolidated siltstone and sandstone occurs along the west side of the river.

Based on existing information, including well logs, topography, and technical reports, the regional static ground water level occurs at a depth of 0 (surficial springs) to about 60 feet below ground surface (bgs) in the alluvium and up to 220 feet bgs for wells drilled in the granite. Well log specific capacity tests produce aquifer transmissivities from 4 to 265 ft^2/day. A nutrient pathogen study conducted for the Cross Timber Ranch Subdivision (Terracon, 1999) in the vicinity of Alder Creek on the south side of Garden Valley.

FIGURE 1. Geographic Location of Terrace Lakes Resort



A slug test on one of the monitoring wells predicted a saturated hydraulic conductivity value of 9 feet per day for the alluvial aquifer, in line with the specific capacity tests performed. An additional nutrient-pathogen study for the River Park Meadows Subdivision (Braun, 2000) located at the northern boundary of the model showed similar conditions in the area.

Climate

Precipitation in Garden Valley, at an elevation of about 3100 feet above seam level, has averaged about 24 inches per year from 1917 to 1995, with most precipitation occurring from November through March. The temperature during these months ranges from 25.9 °F to 37.9 °F (www.worldclimate.com). Discharge is measured in Garden Valley at the Middle Fork of the Payette River near Crouch (USGS Station 13237920). Only data recorded from October 1999 through September 2001 was available http://waterdata.usgs.gov/id, with the April and May flow averaging about 700 cubic feet per second (cfs), and the August through September flow averaging about 90 cfs.

Garden Valley Delineations

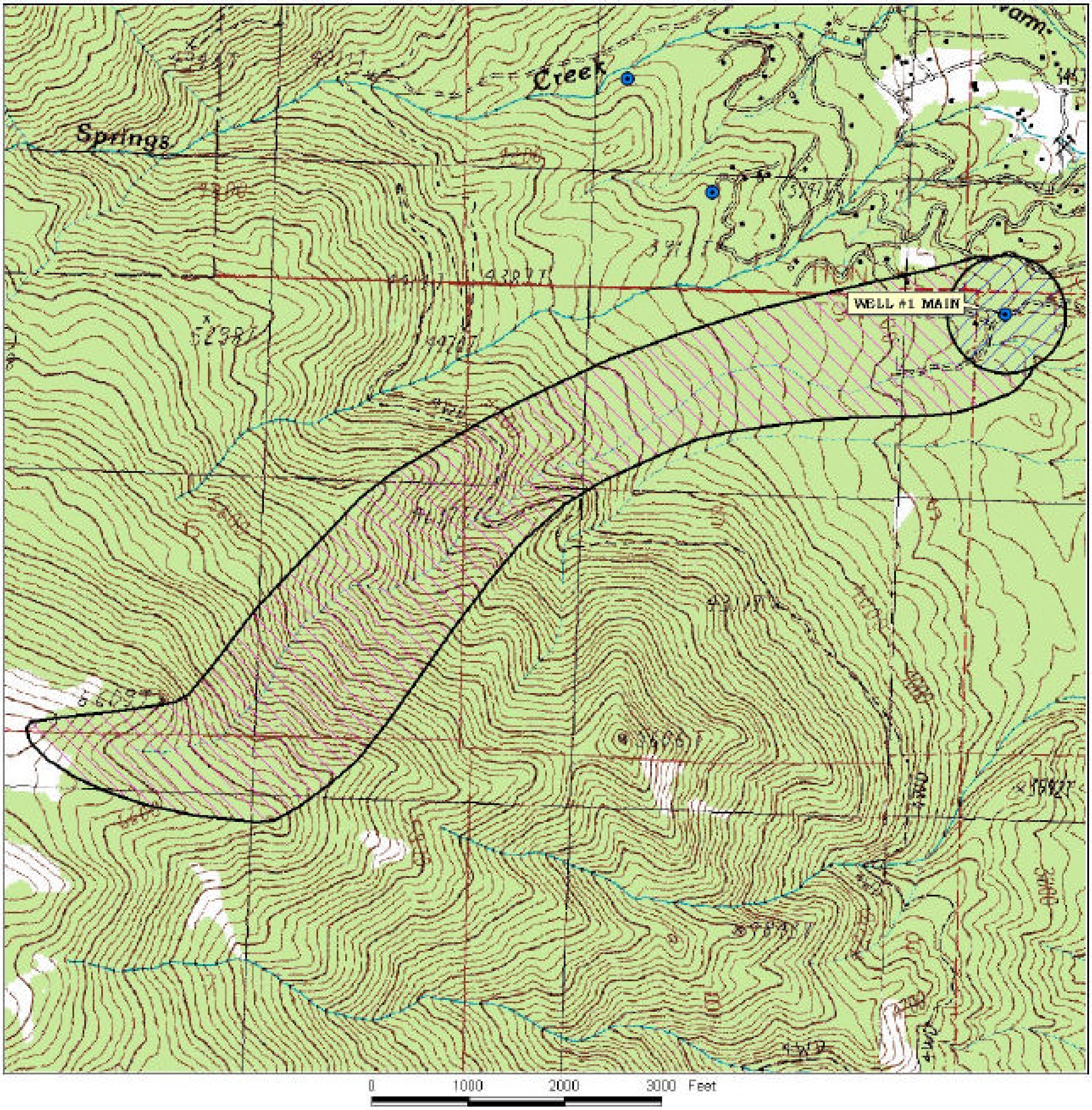
The system well logs as well as the surrounding well logs show that the water table is controlled at the surface by the South Fork and the Middle Fork of the Payette River. Wells drilled exclusively into the granite that is separate from the alluvium have a lower water table. The two forks of the Payette River merge on the southwestern side of the valley and exit from the Garden Valley province. Though a few of the PWS wells (Rivers Point, Garden Valley Ranchettes, Garden Valley High School) are influenced by the South Fork of the Payette, the majority of the PWS wells are located on the western side of the Middle Fork of the Payette River. Fisher et al. (1992) shows numerous faults in the area that could control recharge. Therefore, boundary conditions were assigned to the northward trending faults along the western side of Garden Valley as well as the northeast trending faults on the southeast and northern sides of Garden Valley. Each of the faults were backed by a no flow boundary. The eastern extent of the model was placed at the surface extent of the granitic layer. Both forks of the Payette River were added to help constrain the water table gradient. Test points were added throughout the area of the wells to help assess the appropriate input of water to the system. Despite the large quantities of water in the valley, recharge was kept quite low (0 to 0.40 inches per year) since the major rock type is granite.

Combined delineations – interaction with fault zones

The majority of the wells were close enough to the western side of the modeled domain to interact with the fault zone bounding the valley. When the wells were in the area of the fault zone (Terrace Lakes Resorts) then a combination of a calculated fixed radius and a watershed model was used. When the WhAEM delineations intersected the fault zone represented as a flux source in the model, a combination of the WhAEM delineation and a topographic watershed delineation was produced.

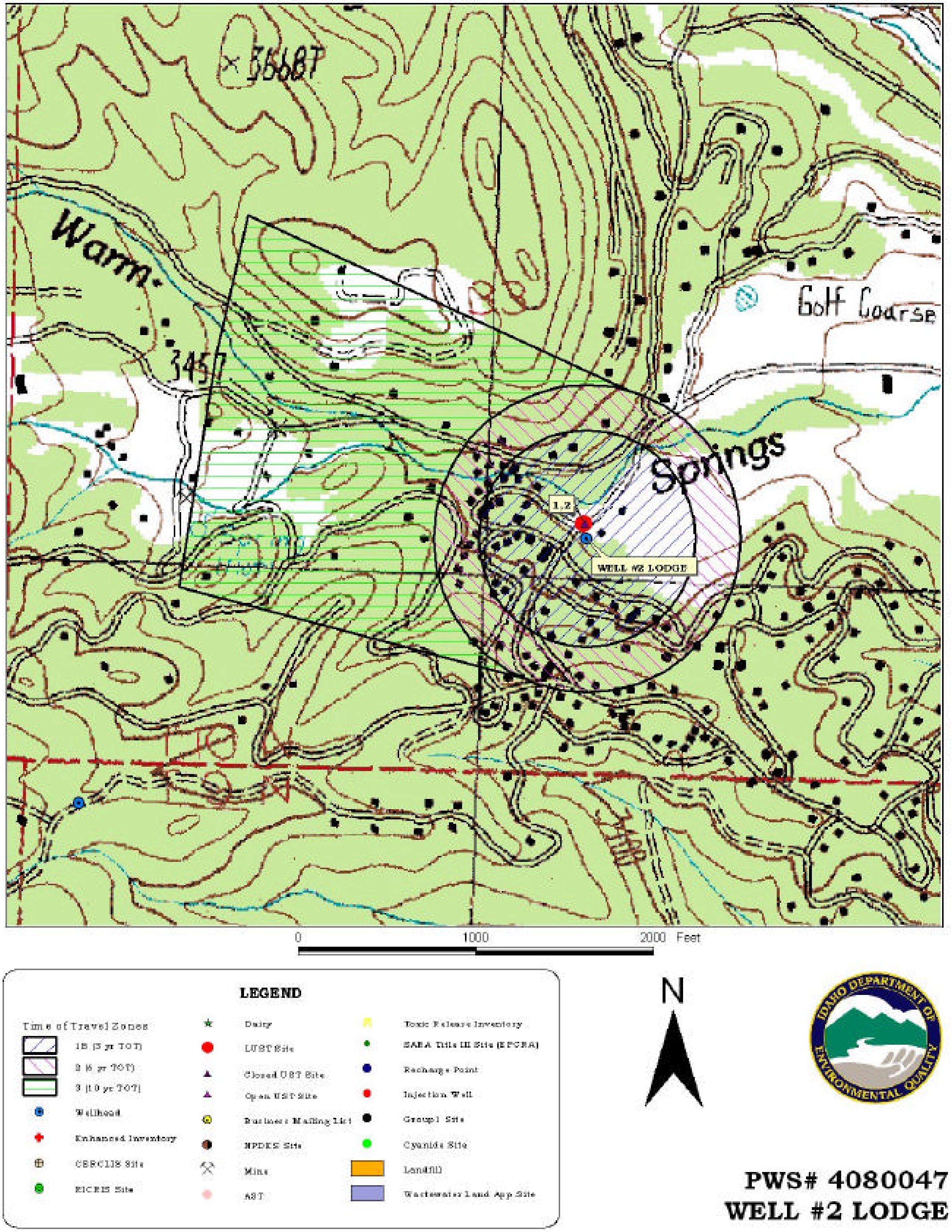
The Terrace Lakes Resorts wells are assumed to be located within the fault zone by being within ½ mile of the mapped location (Fisher et al., 1992). Using the calculated fixed radius method similar to the Castle Mountain Creeks well, the 3- and 6-year TOTs equal 610 feet and 864 feet, respectively. For the well located just to the west of the fault, the 3-year TOT crosses the fault line. As such, a 10-year TOT topographic watershed was added for the segment of stream that likely feeds that section of the fault zone (Figure 2).

FIGURE 2. Terrace Lakes Resort Delineation Map and Potential Contaminant Source Locations



PWS# 4080047
WELL #1 MAIN

FIGURE 3. Terrace Lakes Resort Delineation Map and Potential Contaminant Source Locations



For the Terrace Lakes Resorts well located to the east of the fault, the 3- and 6-year TOTs were calculated with a fixed radius model and the 10-year TOT extended to the fault zone encompassing the stream segment feeding the fault in that location (Figure 3).

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases. Land use within the area surrounding the Terrace Lakes Resort wells is predominately forested lands.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in August and September 2002. The first phase involved identifying and documenting potential contaminant sources within the Terrace Lakes Resort source water assessment areas (Figures 2 and 3) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas.

The delineated source water area for the wells (Figures 2 and 3) have as potential contaminants sources a number of local roads. In addition, Well #2-Lodge has a leaking underground storage tank (LUST) site that was cleaned up and closed. The tank was associated with the Terrace Lakes Resort and is located within the 3-year TOT.

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone (aquitard) above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Well #1-Main rates moderate for hydrologic sensitivity (Table 2). Area soils are moderate to well-drained. The available well log shows that the vadose zones are brown clay. In addition, these clay layers constitute a cumulative 58-foot aquitard above the producing zone, which could potentially reduce the downward migration of contaminants.

Well #2-Lodge rates high for hydrologic sensitivity (Table 2). Area soils are moderate to well-drained. The vadose zone is 60 feet thick and is composed predominantly of permeable materials (topsoil and decomposing granite), with some blue clay. However, the cumulative thickness of the clay layers are less than 50 feet thick (37 feet thick), so there are insufficient low permeability layers to reduce the score.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

Current PWS well construction standards are more stringent than when the wells were constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a downturned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Six-inch casings should be 0.280 inches thick. Although the wells may have met regulations at the time of their construction, the wells were assessed an additional system construction point because they did not meet the current, stricter standards.

Well #1-Main rated moderate for well construction and Well #2-Lodge rated high (Table 2). Though records indicate a sanitary survey was conducted in 2002, at the time of this writing, information regarding the adequacy of the wellheads, surface seals, and flood protection activities had not been quantified. Addition of this information may reduce the scores. Well log information is detailed in Table 1.

Table 1. Summary of Well Construction Information

Well #	Drill Year	Depth (ft)	Casing: diameter/ thickness (in)	Casing: Depth (ft)/ formation	Water Table Depth (ft)	Screened Interval (ft)	Surface seal: depth (ft)/ formation	Sanitary Survey Elements*
W #1	1976	159	6/0.250	156/Decomposed granite with some hard seams	41	156-159 open hole	46/Brown clay	NI/NI
E #2	1966	140	8, 6/0.250	140/Granite gravel	60	100-140	80/Yellow clay	NI/NI

*** Wellhead and surface seal adequate/Protected from surface flooding**
NI = no information available

Potential Contaminant Source and Land Use

The wells rated low for IOCs, SOCs, and microbial contaminants. Well #1-Main rated low for VOCs, but Well #2-Lodge rated moderate for VOCs, due to the LUST site in the 3-year TOT. The large amount of undeveloped forestland surrounding the wells kept the scores reduced, but the presence of local access roads contributed to the scores.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. In this case, the wells automatically rate high for VOCs and SOCs because access is not restricted to vehicular access within 50 feet of the wellheads. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking. If the vehicular traffic could be excluded within 50 feet of the wells, the overall susceptibility would be reduced to moderate for all categories.

Table 2. Summary of Terrace Lakes Resort Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
#1-Main	M	L	L	L	L	M	H*	M	M	M
#2-Lodge	H	L	M	L	L	H	H*	H*	H*	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* = well rated automatically high due to unrestricted vehicular access (Well #2-Lodge) and MCL violations of fluoride

Susceptibility Summary

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In terms of total susceptibility, the Well #1-Main and Well #2-Lodge automatically rate high for IOCs because of multiple fluoride detections exceeding the MCL of 4.0 ppm. In addition, Well #2-Lodge automatically rates high for VOCs and SOCs because access is not restricted to vehicular traffic within 50 feet of the wellhead. Except for these cases, the wells rate moderate for other contaminants. System construction scores and hydrologic sensitivity scores rated moderate for Well #1-Main and high for Well #2-Lodge. Potential contaminant inventory/land use scores were low due to a lack of contaminant sources, except for Well #2-Lodge, which rated moderate land use for VOCs.

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Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the Terrace Lakes Resort, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Actions should be taken to keep a 50-foot radius circle around the wellhead clear of potential contaminants. Restricting access to vehicles and other unauthorized access within this 50-foot radius circle would reduce the susceptibility scores of Well #2-Lodge from high to moderate. Any contaminant spills within the delineation should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of Terrace Lakes Resort, collaboration and partnerships with state and local agencies and industry groups should be established and are critical to success. Because the fluoride in the well has exceeded the level of the revised MCL, the Terrace Lakes Resort water users may need to consider implementing engineering controls to monitor and maintain or reduce the level of this contaminant in the water system.

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A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office	(208) 373-0550
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mlharper@idahoruralwater.com), Idaho Rural Water Association, at 1-208-343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

<u>AST (Aboveground Storage Tanks)</u> – Sites with aboveground storage tanks.

<u>Business Mailing List</u> – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

<u>CERCLIS</u> – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

<u>Cyanide Site</u> – DEQ permitted and known historical sites/facilities using cyanide.

<u>Dairy</u> – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

<u>Deep Injection Well</u> – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

<u>Enhanced Inventory</u> – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

<u>Floodplain</u> – This is a coverage of the 100year floodplains.

<u>Group 1 Sites</u> – These are sites that show elevated levels of contaminants and are not within the priority one areas.

<u>Inorganic Priority Area</u> – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

<u>Landfill</u> – Areas of open and closed municipal and non-municipal landfills.

<u>LUST (Leaking Underground Storage Tank)</u> – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

<u>Mines and Quarries</u> – Mines and quarries permitted through the Idaho Department of Lands.)

<u>Nitrate Priority Area</u> – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

<u>NPDES (National Pollutant Discharge Elimination System)</u> – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

<u>Organic Priority Areas</u> – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

<u>Recharge Point</u> – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **<u>Resource Conservation Recovery Act (RCRA)</u>**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

<u>SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)</u> – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

<u>Toxic Release Inventory (TRI)</u> – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

<u>UST (Underground Storage Tank)</u> – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

<u>Wastewater Land Applications Sites</u> – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

<u>Wellheads</u> – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Attachment A

Terrace Lakes Resort
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : TERRACE LAKES RESORT   Well# : WELL #1-MAIN

Public Water System Number 4080047   10/21/2002 1:43:12 PM

1. System Construction		SCORE
Drill Date	10/27/1976	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	YES	0
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1
	Total System Construction Score	3

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
	Total Hydrologic Score	3

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	0	0	0	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	0	1	1	0
(Score = # Sources X 2) 8 Points Maximum		0	2	2	0
Sources of Class II or III leacheable contaminants or	YES	0	1	1	
4 Points Maximum		0	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
	Total Potential Contaminant Source / Land Use Score - Zone 1B	0	3	3	0
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	0	0	0	0

Cumulative Potential Contaminant / Land Use Score	0	3	3	0
4. Final Susceptibility Source Score	6	7	7	6
5. Final Well Ranking	High	Moderate	Moderate	Moderate

Ground Water Susceptibility Report   Public Water System Name : TERRACE LAKES RESORT   Well# : WELL #2 LODGE

Public Water System Number 4080047   10/21/2002 1:43:25 PM

1. System Construction		SCORE
Drill Date	4/28/1966	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	NO	1
	Total System Construction Score	6

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	5

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	1	2	2	1
(Score = # Sources X 2) 8 Points Maximum		2	4	4	2
Sources of Class II or III leacheable contaminants or	YES	1	2	1	
4 Points Maximum		1	2	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		3	6	5	2
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		3	3	3	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0

Cumulative Potential Contaminant / Land Use Score	8	11	10	2
4. Final Susceptibility Source Score	13	13	13	12
5. Final Well Ranking	High	High	High	Moderate